

The "Kent" Patent System of Concrete Construction

Proof

**HOW TO BUILD
HOUSES
ECONOMICALLY
EFFICIENTLY
AND RAPIDLY**



COL. H. VAUGHAN KENT & PARTNERS, *Housing Consultants*
34, VICTORIA STREET :: WESTMINSTER, LONDON, S.W.1

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THE "KENT" PATENT SYSTEM OF CONCRETE CONSTRUCTION

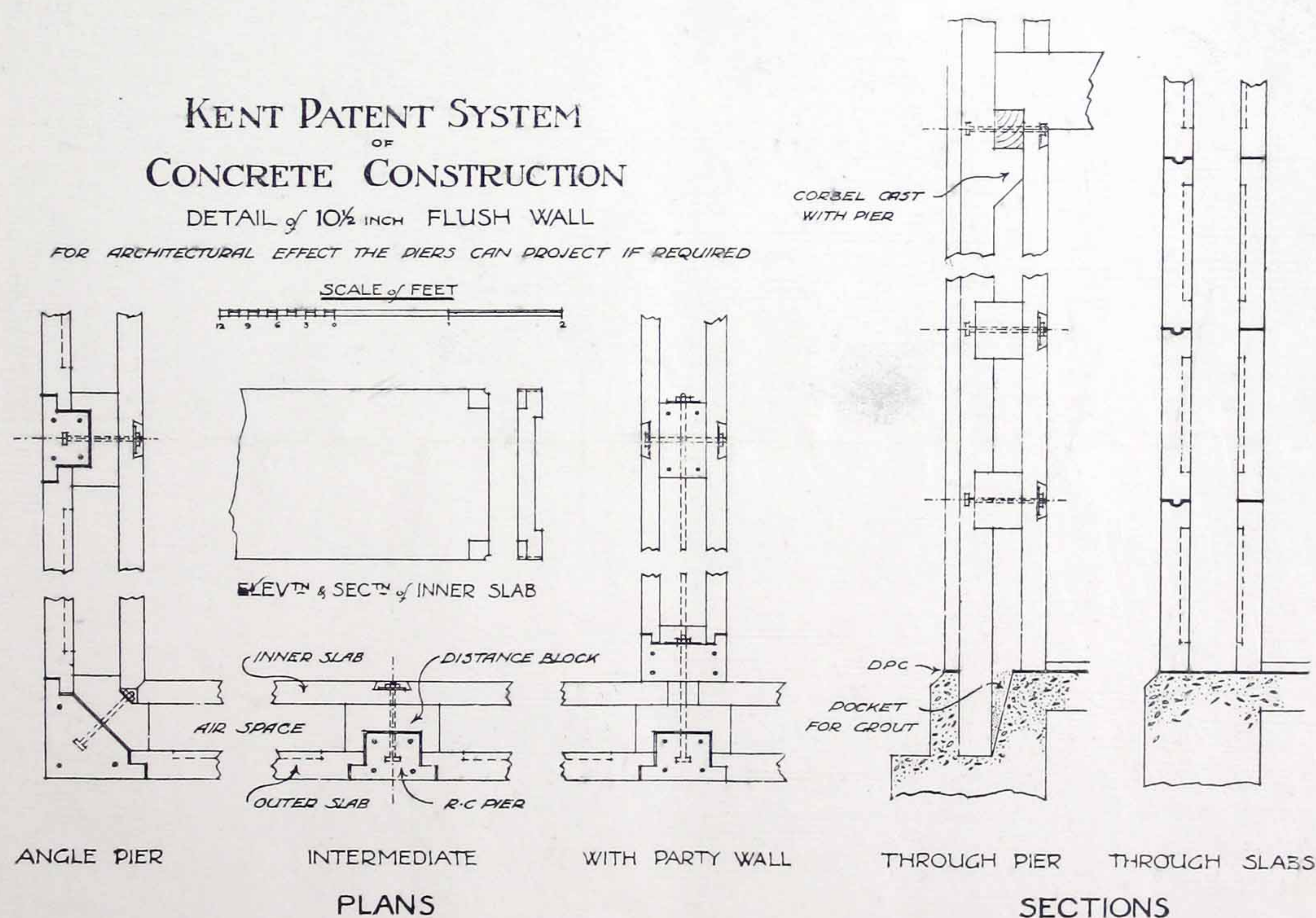
THE object of this small brochure is to present to Local Authorities, Public Utility Companies, Industrial Corporations and all others interested in the Housing Question, a lucid explanation of the "Kent" Patented System of Concrete House Construction.

The present shortage of houses is so universally acknowledged that it is a waste of time to labour the point ; suffice it to say that the shortage proved to exist at the time of the Ministry of Health survey in 1919 has not yet been touched.

In fact, the houses being erected under authorised schemes, and by private enterprise, are not sufficient to cope with the normal increase of population, and instead of the shortage being gradually decreased it has actually increased.

It is obvious to anyone but slightly acquainted with the present conditions, that if progress is to be made, some alternative method of construction must be employed, and there is not the slightest doubt that concrete must perforce play a large part in the solution of the problem.

The "Kent" System of concrete construction has been thoroughly investigated by a few experts in housing, and as a result has already been adopted by two well-known Architects as being the best system yet devised.



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THE "KENT" PATENT SYSTEM

The particular merits of the system are so obvious that even a cursory examination of the construction will convince the most sceptical that this is "the" system to adopt if the housing shortage is to be overcome within a reasonable time.

Construction

THE "Kent" system is on what is generally known as the "Pier and Panel" method and consists of reinforced concrete piers or uprights (see detail) erected about 4 ft. 6 in. apart. The outer walls are formed by inner and outer leaves, or skins, fixed to the piers in a very simple, effective, and economical manner by unskilled labour in



A pair of "Subsidy" houses at Marlow

such a way as to produce a hollow wall with a continuous cavity of any width, the whole resulting in an absolutely damp-proof house entirely free from condensation, and most equable in temperature.

Piers

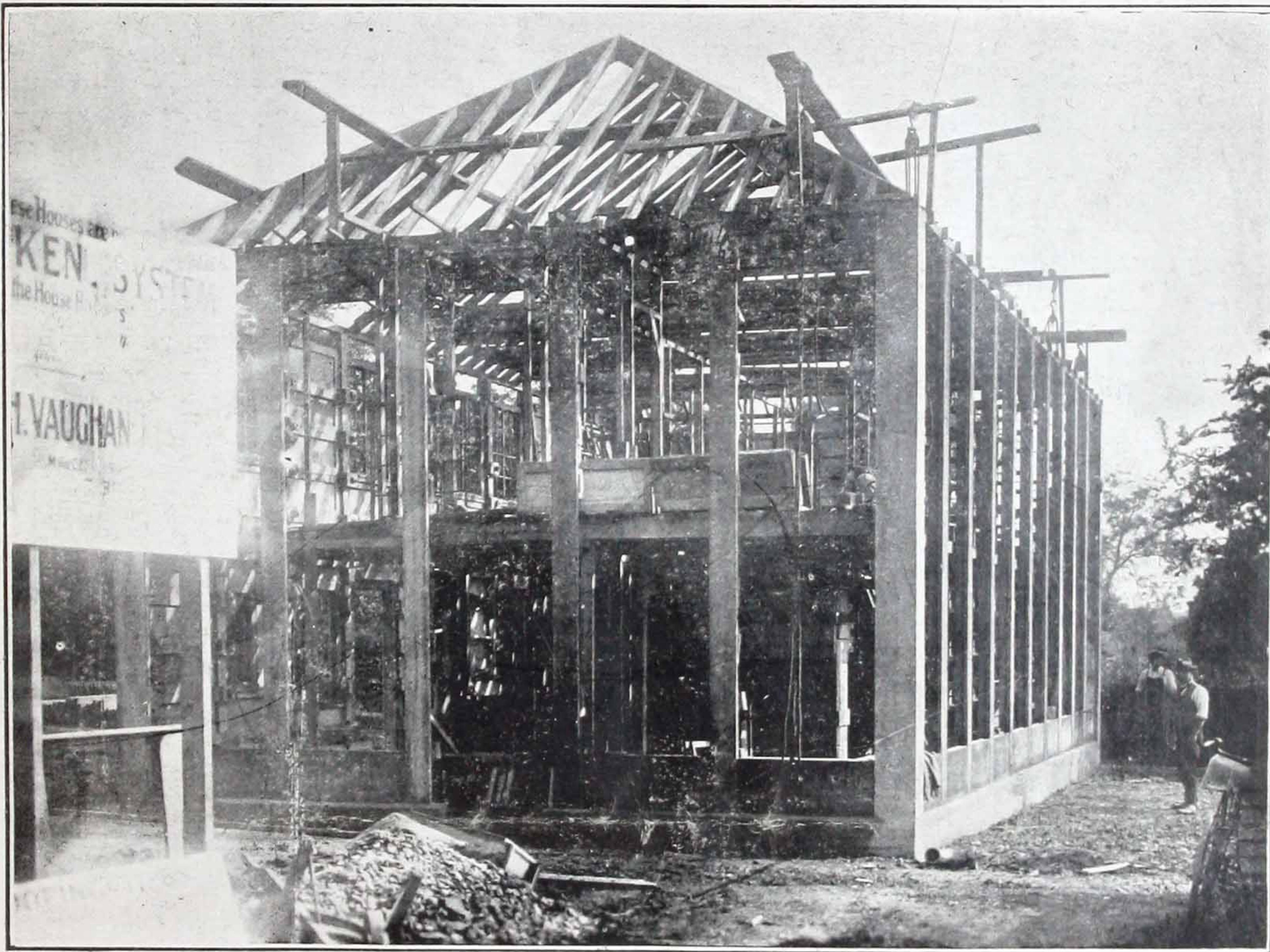
THE piers or uprights are of reinforced concrete rebated on two sides to hold the outer slabs, or skin, and have horizontal projecting bolts embedded to secure them and the inner slabs. These bolts are either of non-corrosive metal or are properly protected. Corbels, or Brackets, are cast on the piers for the wall plates to carry the first floor.

Outer Skin

The outer skin is formed of 2 in. wet-cast concrete slabs with a 3 in. thick border all round made with gravel chippings or similar aggregate. The slabs are 4 ft. by 1 ft. 6 in. high (being designed in size for a "two-man-power handling standard").

Inner Skin

The inner skin is formed of 2 in. or $2\frac{1}{2}$ in. concrete slabs 4 ft. 6 in. by 1 ft. 6 in., made with clinker breeze, or similar non-conducting aggregate.



A Pair of "Subsidy" houses at 7 a.m.

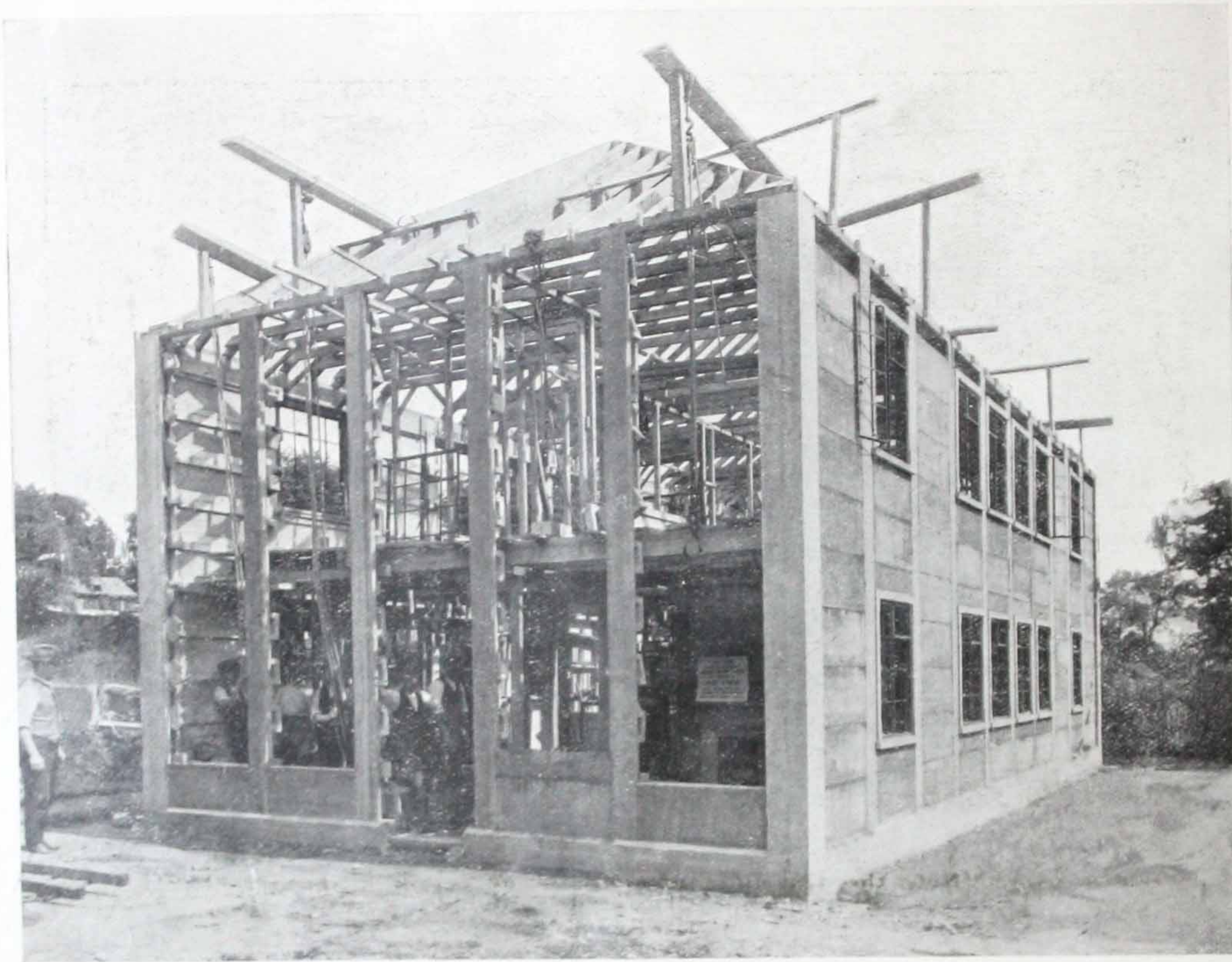
Method of Erection

THE piers, or uprights, are made with "super-cement" and are first erected all round the block, being fixed into sockets in the concrete foundations and tied together at the top by a stout wall plate, and kept in position by temporary struts. The

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slabs for the outer leaf are then placed against the rebates of the piers and the joint is made by pouring cement grout into a groove on top of the slab, which is squeezed out by a tongue on the under side, no bricklayer is required for this operation.

Small concrete chocks, or distance pieces, made with super-cement, about 12 in. by 6 in. by 6 in., holed for the bolts, are then threaded on to the bolts which are left projecting on the inside of the pier; the depth of these distance pieces determines the size of the air cavity.



The same houses at 11 a.m. the same day.

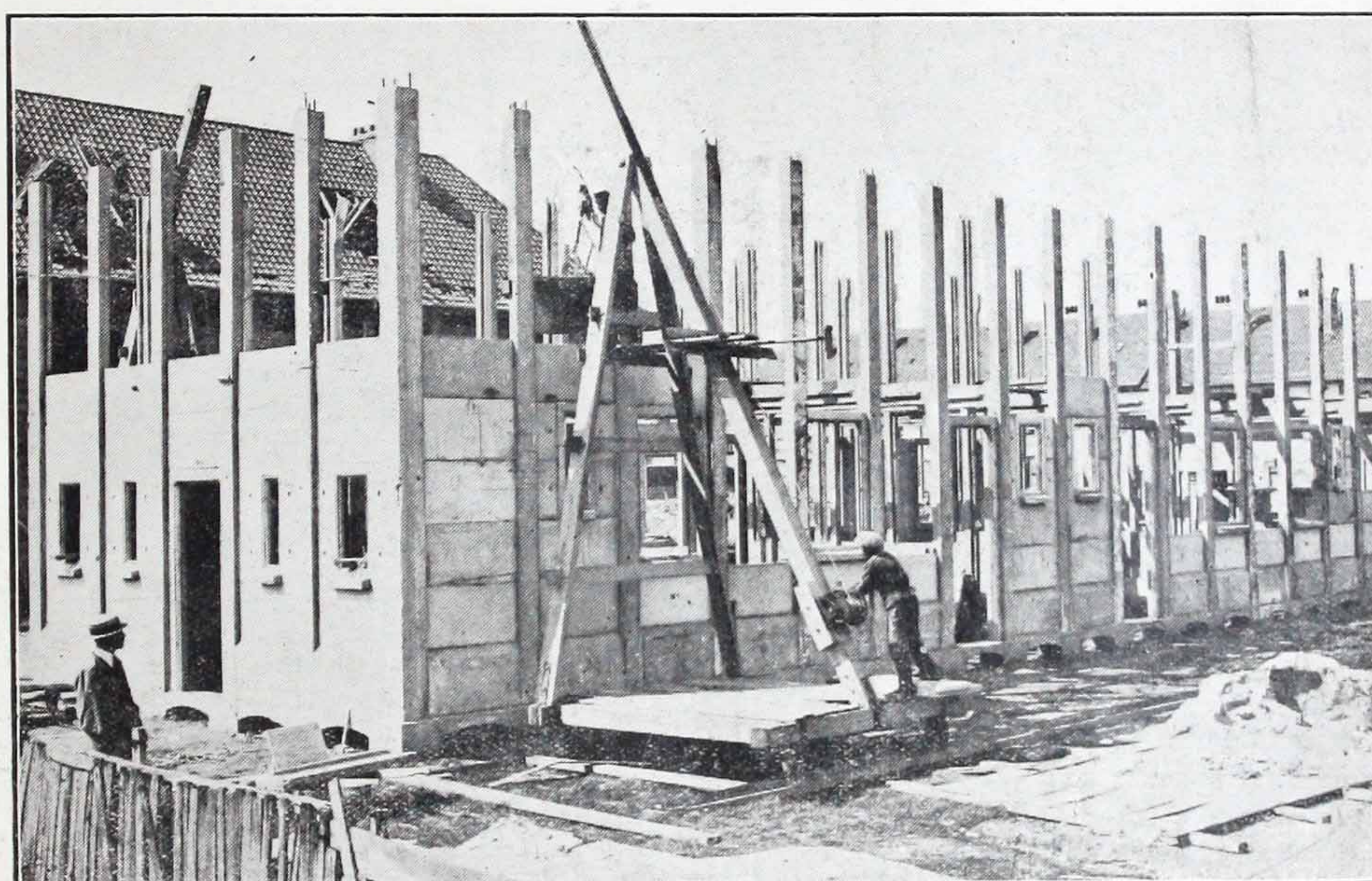
The inner leaf is then formed by placing the slabs to butt up against each other vertically and horizontally, the leaf being kept plumb by the fact that the slabs fit close up against the distance pieces. The slabs are permanently fixed in the following way:—

Where four slabs butt against each other a small quadrant is left on the corner of each slab, and a quadrant countersinking is left also on each slab, this resulting in a

C O L . H . V A U G H A N K E N T & P A R T N E R S

complete hole and countersinking, a quarter on each slab. The hole coincides with the bolt projecting internally from the pier. The bolt comes through the hole in the four slabs, and has a large washer fitted over it, which washer and the head of the bolt are in the countersinking, and do not project.

The nut is tightened, with the result that the inner and outer leaves are fixed firmly and a perfectly rigid and workmanlike job results. The countersinking is then filled up with a little cement mortar and a perfectly straight wall ready for plastering or other finish is made.



"Kent" houses in Belgium in course of construction. Note the travelling derricks for erecting columns and lifting slabs. No scaffolding.

Rapidity of Erection

THE speed at which houses can be erected under the "Kent" system of construction is one of its particular features, and in view of the abundance of unskilled labour available, there is practically *no limit* to the number which can be erected on a large site.

The whole of the structural components are made on site. No skilled labour is required to fix the slabs to the reinforced concrete piers. Practically no scaffolding is

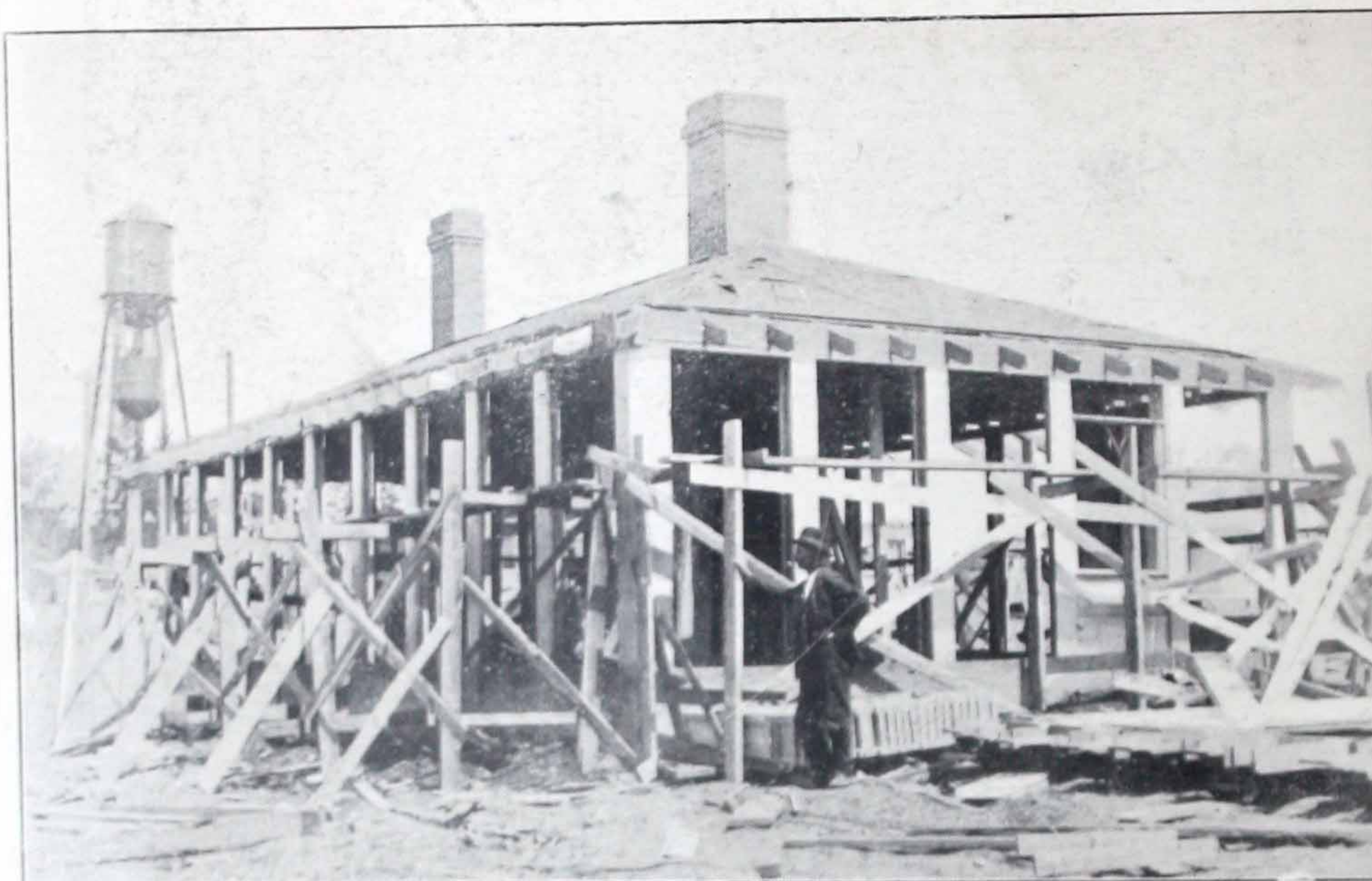
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needed, a considerable saving resulting thereby. No special machinery is necessary and the wooden moulds can be easily made by any intelligent carpenter.

Rough casting outside is unnecessary if columns are left to show.

Window and door frames are secured to the piers by the distance blocks in the same way as are the slabs.

These frames can be made of pre-cast concrete and will last indefinitely without needing any repairs.



A "Kent" house in America in course of construction.
Note the roof on before the panelling of the walls is started.

Advantages

THE life of concrete houses is practically unlimited, and is longer than that of brick houses. This is universally admitted.

Maintenance costs are infinitesimal as far as the fabric is concerned.

Repointing is unnecessary, which is not the case with brickwork.

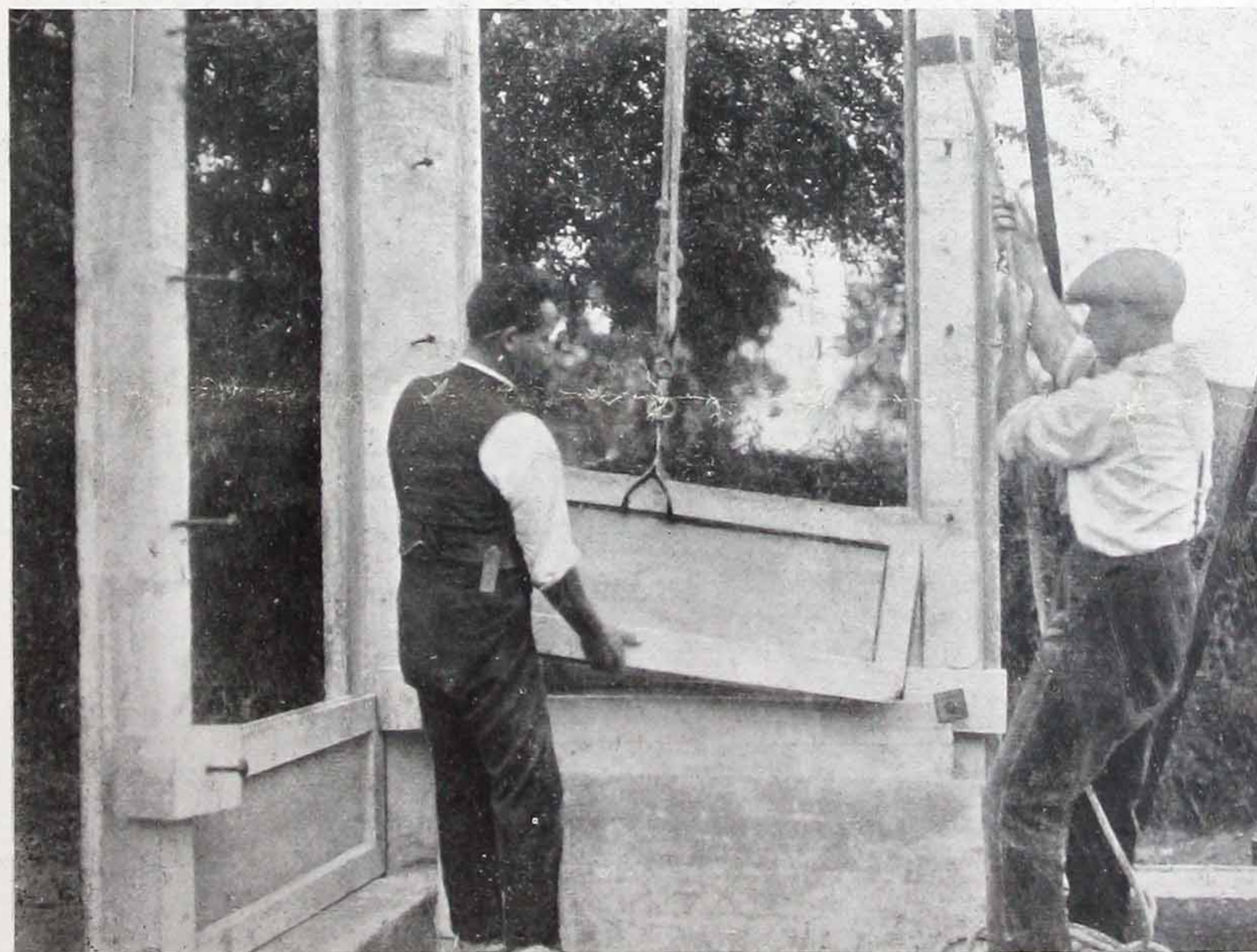
Condensation, or "sweating" on the inner surface is eliminated. The large air space provided by the "Kent" system keeps the house cool in summer and warm

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O F C O N C R E T E C O N S T R U C T I O N



in winter to a much greater extent than the ordinary so-called "Hollow" concrete blocks, where there are numerous bridges of concrete connecting the inner and outer surfaces of the walls.



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THE "KENT" PATENT SYSTEM

The design can be varied very considerably and there is hardly any limit to the architectural features that can be introduced, thus obviating the common objection with regard to monotony and uniformity.



The first "Kent" house.
Erected near Shoeburyness by the War Department
early in 1920. Cost per foot cube under 1s. 2d., a record
price in those days.

The houses erected under the "Kent" system are remarkably rigid, as instanced in the sample house erected by the War Department in 1920 on Havengore Creek, within 1,000 yards of the 15 in. gun platform.

Although subject to concussion from heavy gunfire for some years this house has never been noticed to shake.

The system can be adapted to suit most types of buildings. In Halls, Stores, Garages, Factories, Boundary Walls, etc., where the bulk of the cost goes into the walling, the economy of this system is still more marked than it is in ordinary dwelling houses.

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The "Kent" system has been tried out in America and in Belgium with highly satisfactory results.

In America, where concrete is extensively used and where concrete houses are better understood than they are here, the "Kent" system has been very favourably reported upon and the "Kent" Company of America has been incorporated to operate the patent in the United States. The Belgium Government, when building their experimental village near Brussels, employed all the systems known to them, and amongst other British systems erected a block of four "Kent" houses.



"Kent" Bungalow erected at Roxboro, North Carolina, U.S.A., in 1924.
Cost \$2,600, very little more than a timber frame house of same size.

THE "KENT" PATENT SYSTEM

These were entirely satisfactory, and the following extract from a letter written by a leading Consulting Engineer in Brussels is interesting :—

"As far as I can see the houses constructed after your system will certainly be the best of all systems which have been built here, especially as far as comfort is concerned."



A Block of four "Kent" Houses erected at la Roue, near Brussels, in 1923. Cost less than brick houses, with bricks at 24/- per 1,000.

The Skilled Labour Difficulty Overcome

THE "Kent" house needs a minimum of skilled labour.

The walls can be erected entirely by unskilled workmen under a skilled charge hand, thus saving bricklayers.

There is no necessity to rough cast or cement the outside, a thick cement wash being perfectly efficient and pleasing in appearance, thus saving plasterers.

Internally the use of patent ceiling covering reduces further the number of plasterers required, and as the internal slabs fit so closely it has been found that a satisfactory finish can be made by using fabric glued to the walls, thus eliminating the plasterer entirely, if necessary.

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A few comments and opinions on the "Kent" system of concrete housing construction from eminent people interested in housing including Architects, Builders, Surveyors, and actual occupiers, etc.

DOUGLAS WOOD, ESQ., F.R.I.B.A., F.S.I., *Architect*,
35, Craven Street, Strand, W.C.2.

Copy of letter dated October 1st, 1924.

I have made an inspection of the houses now being erected at Marlow, England, on the "Kent" System of Concrete Construction. The system adopted is the pre-cast reinforced concrete post and concrete panel system. This construction gives a continuous air space or cavity between the inner and outer linings from top to bottom of the wall. There are many ingenious arrangements in connection with the construction which make both for strength and comfort.

The system can be adapted to practically any class of work, and is particularly suitable for housing schemes, factory construction, garages, and other similar buildings where the walling bears a high proportion to the total cost. The windows can be in steel or wood as required, and a concrete frame round the doors and windows gives a pleasing appearance to the elevations and reduces the cost of future upkeep.

No special plant or machinery is required for the manufacture of the reinforced posts or panels. Any practical builder can understand the system and carry it out by unskilled labour—skilled supervision only being necessary.

I should have no hesitation in specifying the use of this system where conditions are suitable, and consider it one of the best yet designed.

(Sgd.) DOUGLAS WOOD,
F.R.I.B.A., F.S.I.

J. PEMBERTON, ESQ., *Builder and Constructor*,
Chairman of Warrington Housing Committee.

Copy of letter dated October 23rd, 1924.

DEAR COLONEL KENT,

In reference to your system I may say that I am wholeheartedly in favour of the same. I have examined on my own account, and also on behalf of my Corporation, every system of Concrete House Building that there is on the market, and I have not the slightest hesitation in saying that I am positive that yours is not only the simplest and cheapest, but will require less skilled labour than any other system, and if your specification is carried out to the full, it is a thoroughly dry, warm and comfortable building, free from condensation, which is the fault of many other systems. It is also, in my opinion, considering the stability and utility of the system, one that can be very rapidly built. It is also economical, durable, and there is practically no cost for upkeep. It is adaptable to practically any style of architecture, and can also be used for buildings of practically any size or for any purpose. I have not the slightest hesitation that where bricks are practically impossible to get or in districts where they are a very high price, it is by far the most economical form of construction.

With kind regards,

Yours faithfully,
(Sgd.) JNO. PEMBERTON.

J. E. DROWER, ESQ., C.B.E., F.S.I., *Surveyor*.

Extract from letter dated September 24th, 1924.

Certainly your system appears to me to be superior to any I have seen both as to its constructional merits and price.

THE "KENT" PATENT SYSTEM OF CONCRETE CONSTRUCTION

J. E. SIRRINE & Co., Architects,
Greenville, S. C., U.S.A.

Copy of letter dated June 3rd, 1924.

The writer has made an examination of the "Kent" System of houses shown on drawings submitted by Mr. J. P. Ashley Waller, and have also made a detail examination of a building actually constructed from these plans using the "Kent" System.

Our examination indicates that the "Kent" System is adaptable to standard mill tenements and practically any of the designs adopted for mill tenements can be reproduced with this construction, and on the basis obtained on the model house, will approach within reasonable limits the cost of ordinary wood construction.

The advantage of the "Kent" System is the elimination of all studding and weatherboarding which is replaced with concrete uprights and concrete slabs which take their place. This eliminates all wood from the foundation to the cornice with the exception of the wooden windows and sashes. Owing to the permanent type of construction, the ultimate cost of this type of house, considering the upkeep and repairs, should in a period of a few years more than offset the initial difference in cost. With roofs of proper materials, a material saving should be effected in insurance, and the fire hazard very materially reduced.

We believe that the design is well worth consideration on the part of industrial plants and contracting organisations building this type of house.

Truly yours,

J. E. SIRRINE & COMPANY.

THE A. T. BAKER COMPANY, Manufacturers,
Philadelphia, Pa., U.S.A.

Copy of letter dated May 21st, 1924.

DEAR MR. WALLER,

After careful inspection of the house built in our village under the "Kent" System of Construction we found it to be satisfactory in every particular.

What appeals to us particularly about the house is its permanence, the fact that it is fireproof, and its better insulating qualities which tend to make the house cooler in summer and warmer in winter.

The way this house is built, I do not see how there could be any question as to its lasting for an indefinite period of time, and this permanence means not only a low maintenance cost but also a house which will always look well. It has been my observation that in many of the mill villages in the South the houses depreciate much more rapidly than the mill building, resulting in a fine looking mill surrounded by a village of dilapidated houses.

The appearance of the house is particularly attractive and the fact that it requires no painting to keep it in its white condition will help to maintain the appearance of the outside of the building.

We can assure you that if we erect any further houses in our village in Roxboro that this type of house which you recently completed will receive our most favourable consideration.

Yours very truly,

(Sgd.) A. T. BAKER,

THE A. T. BAKER COMPANY INC.

MR. J. T. CORK,
Bridge Cottage,
Havengore Island.

Copy of letter dated February 15th, 1924.

DEAR SIR,

In answer to your letter which I received on Friday last in which you asked me if the house kept perfectly dry and warm—to tell you the honest truth I have found it *very dry* indeed . . . and I am sure the rooms *are warmer* than the last house I lived in, which was a brick one. I had thirteen years in that and I must confess this is the *best house I have lived in* and a very convenient one. *Heavy gunfire does not affect it in the least*, and as you know we are quite close to the guns, and I can assure you we have had some very heavy gunfire just across the creek. I have lived in *four* different houses before I came in this one and I *much prefer this to any other*.

Yours faithfully,

(Sgd.) J. T. CORK.

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